WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005AK43B

Title: Investigation of the mechanism of arsenic biosorption by modified crab shells

Project Type: Research

Focus Category: Water Quality

Keywords: biosorption, arsenic, crab shells, chitosan, mechanism

Start Date: 03/01/2005

End Date: 02/28/2006

Federal Funds: $28,568

Non-Federal Matching Funds: $9,496

Congressional District: AK

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Abstract

Preliminary USGS-funded research has shown that chemically modified crab shells are able to bind arsenic. Arsenic (As) uptake increased with the degree to which crab shell chitin was converted to chitosan by deacetylation. This observation is compatible with the hypothesis that amine groups of chitosan play a major role in arsenic binding by modified crab shells. The objective of the proposed research is to investigate the mechanism of arsenic binding by modified crab shells, which mainly consist of chitosan, and the role that amine groups play in arsenate binding. This investigation will be addressed through a combination of different techniques including FTIR, sorption studies at different pH and ionic strengths, and electrophoretic mobility measurements.